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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/587,428

04/18/2007

Johan Engstrom

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EXAMINER

SEIFU, LESSANEWORK T

ART UNIT

PAPER NUMBER

1797

MAIL DATE

DELIVERY MODE

05/03/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/587,428	Applicant(s) ENGSTROM ET AL.	
	Examiner Lessanework Seifu	Art Unit 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 February 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 July 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the microfluidic device comprising a microchannel structure in which there are two or more flow paths all of which comprises a porous bed I that is common for all of the flow paths, wherein at least one of the flow paths comprises a second porous bed II that is placed upstream of porous bed I, and wherein the upstream end of porous bed I is abutted to the downstream end of porous bed II must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner,

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the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 8-10 and 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
3. Claim 7 recites the limitation "said at least one flow path" in lines 2-3 of the claim. There is insufficient antecedent basis for this limitation in the claim.
4. Claim 8 recites the limitation "said one, two or more flow paths" in line 2 of the claim. There is insufficient antecedent basis for this limitation in the claim.
5. Claim 9 recites the limitation "said at least one, two or more flow paths" in 2 of the claim. There is insufficient antecedent basis for this limitation in the claim.
6. Claim 10 recites the limitation "said at least one flow path" in lines 1-2 of the claim. There is insufficient antecedent basis for this limitation in the claim.
7. Claim 14 recites the limitation "said at least one flow path" in 2 of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1, 2, 5-13, 16 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Tooke et al. (WO 01/47638).

Regarding claims 1, 2 and 5-10, Tooke et al. disclose a microfluidic device (2) comprising a microchannel structure (1) in which there are two or more flow paths (5, 7, 8, 9) all of which comprises a porous bed I (35) that is common for all of the flow paths, which bed exposes an immobilized reactant R that is capable of interacting with a solute S that passes through the bed (see page 16, lines 5-10 and page 18, lines 30-34), wherein at least one of the flow paths (5) comprises a second porous bed II (15) that is placed upstream of porous bed I (35) and is dummy with respect to interaction with solute S but capable of interacting with a substance DS that is present in a liquid aliquot together with solute S and is capable of disturbing the result of the interaction between solute S and said immobilized reactant R (see page 15, lines 10-26, page 18, lines 7-20 and Figs. 1a-c). Tooke et al. disclose that the porous bed I (35) and the porous bed II (15) are physically separated from each other (see Fig. 1b). Tooke et al. further disclose that porous bed I (35) and porous bed II (15) are formed of packed bed of particles (see Fig. 1b and page 14, lines 20-22 and 30-33). Tooke et al. further disclose that at least one of porous bed I and porous bed II comprises a solid phase material that is a size

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exclusion material (see page 18, lines 30-34). Tooke et al. further disclose that at least two or more (8, 7, 9) of the remaining ones of the two or more flow paths are devoid of porous bed II (15) (see Fig. 1b). Tooke et al. further disclose that the porous bed II (15) comprises an immobilized reagent that is capable of interacting with a disturbing substance that is present together with solutes (see page 18, lines 7-20). With respect to claim 7, the limitation recited in the claim is directed to an intended use of the claimed device and does not structurally further limit the apparatus claim. Neither the manner of operating a device nor a material or article worked upon further limit an apparatus claim. See MPEP § 2114 and 2115. Further, process limitations do not have patentable weight in an apparatus claim. See *Ex parte Thibault*, 164 USPQ 666,667 (Bd. App. 1969) that states "Expressions relating the apparatus to contents thereof and to an intended operation are of no significance in determining patentability of the apparatus claim."

Regarding claim 11, the process steps recited in the claim read on the microfluidic device (2) and the exemplary microfluidic process disclosed in the reference Tooke et al. (see Fig. 1b and page 18, lines 7-35).

Regarding claims 12, 13, 16 and 17, the limitations recited in the claims read on the microfluidic device disclosed in the reference Tooke et al. (see Fig. 1b and page 18, lines 30-35). In this instant case, since there is no distinction between the material of applicants' porous bed I and porous bed II, the porous beds I and II recited in claims 12, 13, 16 and 17 are equated to the porous bed (35) depicted in Figure 1b of the reference Tooke et al. The porous bed (35) in the reference Tooke et al. can appropriately be construed as having an upstream section which corresponds to applicants' porous bed II

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and a downstream section which corresponds to applicants' porous bed I. Accordingly, the claimed microfluidic device as recited in claims 12, 13, 16 and 17 is anticipated by Tooke et al.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

12. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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13. Claims 3, 4, 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tooke et al. (WO 01/47638) as applied to claims 1 and 12 above, and further in view of Mehta et al. (US 6,632,655).

Regarding claims 3 and 4, Tooke et al. does not disclose a different additional porous bed being placed abutted to the upstream end of neither the porous bed I (35) nor the porous bed II (15). Mehta et al. disclose a microfluidic device comprising particle sets/porous beds (see Abstract). Mehta et al. disclose that the particle sets/porous beds can be fixed in position in microfluidic flow paths for use as affinity purification devices, molecular capturing devices or for other purposes including acting as blank particles, dummy particles, test particles (see col. 2, lines 26-50 and col. 3, lines 1-24). Mehta et al. further disclose that the end of a first particle set/porous bed can be provided to abut to an end of a second particle set/porous bed (see col. 2, lines 50-65 and Fig. 3B). Mehta et al. further disclose that particle sets/porous beds can be fixed in place by a porous matrix capable of inhibiting particle/bead movement (see col. 13, lines 46-60). It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the teachings of Tooke et al. and Mehta et al. and provide a microfluidic device in configuration as claimed for the purpose of carrying out affinity purification and detection procedure of a wide variety of liquid samples, because Mehta et al. discloses that the particle sets of their inventions are advantageous for use as affinity purification devices in microfluidic systems (see col. 2, lines 26-36 and col. 9, lines 28-38).

Regarding claims 14 and 15, Tooke et al. does not disclose a different additional porous bed being place abutted to an upstream end of the porous bed I (35). Mehta et al. disclose a microfluidic device comprising particle sets/porous beds (see Abstract). Mehta et al. disclose that the particle sets/porous beds can be fixed in position in microfluidic flow paths for use as affinity purification devices, molecular capturing devices or for other purposes including acting as blank particles, dummy particles, test particles (see col. 2, lines 26-50 and col. 3, lines 1-24). Mehta et al. further disclose that the end of a first particle set/porous bed can be provided to abut to an end of a second particle set/porous bed (see col. 2, lines 50-65 and Fig. 3B). Mehta et al. further disclose that the first particle set/porous bed can comprise a tag ligand and the second particle set/porous bed can comprise an anti-tag ligand (see col. 53, lines 4-27). Mehta et al. further disclose that exemplar tag and anti-tag ligands include biotin (see col. 5, lines 27-36). It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the teachings of Tooke et al. and Mehta et al. and provided a microfluidic device in configuration as claimed for the purpose of carrying out affinity purification and detection procedure of a wide variety liquid samples, because Mehta et al. discloses that the particle sets of their inventions are advantageous for use as affinity purification devices in microfluidic systems (see col. 2, lines 26-36 and col. 9, lines 28-38).

Conclusion

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lessanework Seifu whose telephone number is (571)270-3153. The examiner can normally be reached on Mon-Thr 9:00am-6:30pm; Fri 9:00am-1:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter Griffin can be reached on 571-272-1447. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/L. S./
Examiner, Art Unit 1797

/Walter D. Griffin/
Supervisory Patent Examiner, Art Unit 1797